



Friction Costs

SEMA-Las Vegas
October, 2012



Costs, both implied and direct, associated with a transaction. Such costs include time, effort, money, and associated tax effects of gathering information and making a transaction.

Sale Less Costs
Equals
Gross Profit

The Collision Repair
Industry Wants to
Increase its Sales

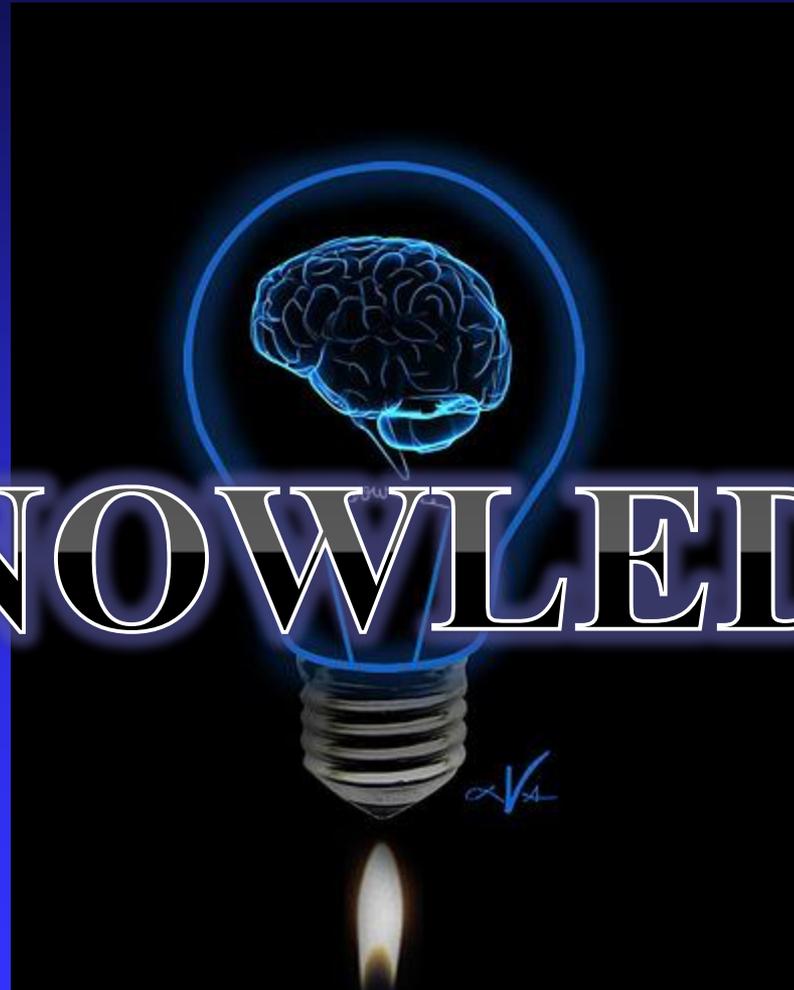
VS

The Insurance Industry
Wants to decrease its
costs

The Result is Friction

The key to reducing friction costs is

KNOWLEDGE



5 Years in Future

Today



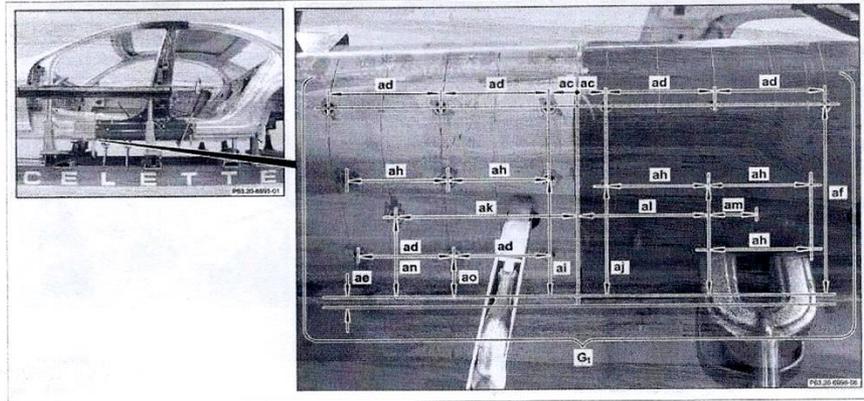
Vehicle Repair
Knowledge



11 Scribe rivet holes at center on outer longitudinal member (2) (area F).

12 Center punch rivet holes at center on outer longitudinal member (2) using BTR Usibor center punch, dia. 8 x80 mm (area F).

12 Drill rivet holes at center on outer longitudinal member (2) with BTR Usibor drill bit, dia. 6.7 mm (area F).



PG3 20-6999-09

Dimensions:

ac 20 mm
ad 60 mm
ae 5 mm
af 155 mm
ah 60 mm
ai 102 mm
aj 103 mm
ak 102 mm

al 80 mm
am 30 mm
an 72 mm
ao 41 mm

13 Scribe rivet holes at bottom on outer longitudinal member (2) (area G).

14 Center punch rivet holes at bottom on outer longitudinal member (2) using BTR Usibor center punch, dia. 8 x80 mm (area G).

15 Drill rivet holes at bottom on outer longitudinal member (2) with BTR Usibor drill bit, dia. 6.7 mm (area G).

19 Drill rivet holes on outer longitudinal member (2) with BTR Usibor drill bit, dia. 6.7 mm (areas I, J, K, L and N).

It is necessary to maintain the intervals of the rivet holes to the edge of the flange to prevent the BTR steel from tearing.

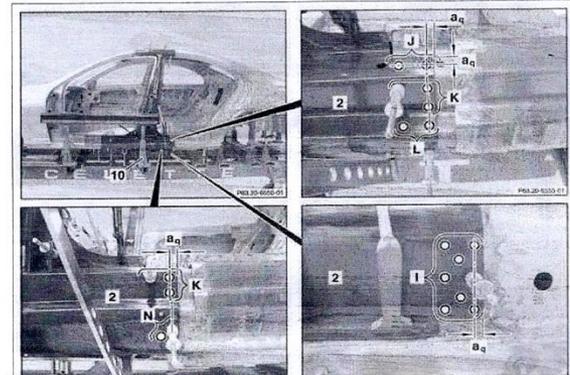
Dimensions:

aq 11 mm

16 Remove outer longitudinal member (2) and doubler panel (4).

17 Deburr rivet holes on outer longitudinal member (2) and doubler panel (4) on both sides.

18 Coat insides of riveted joints with zinc dust paint.





Adhesives





A 2011 BMW 7 Series was towed to a BMW referred body shop with damage to the left rear wheel. The door to quarter gap and quarter panel to deck gap showed no visible movement. The collision center wanted to put the vehicle on a bench(their expertise in BMWs dictated mounting the car onto the bench) to measure the vehicle, but the insurance company said no due to the fact that they could not see any panel movement.



XYZ Comparative Rear Repair Analysis

Left Image Right Image



View Settings

Mitchell Idents Wand Idents Trusted Pts Damaged Pts

XYZ Comparative

XYZ Comparative Measurements

Legend

	++ Positive ++	-- Neagative --
Mash Length (ΔX)	Too Long	Too Short
Sway Width (ΔY)	Too Wide	Too Narrow
Sag Height (ΔZ)	Too High	Too Low

1	Y-Bar	0	0	0
3	3rd	4	-1	5
4		0	0	0
6		0	0	0

Damaged Points

		Mash	Sway	Sag	
Id	Control	Point Name	Delta Length (ΔX -Depth)	Delta Width (ΔY)	Delta Height (ΔZ)
5			7	2	9

Paired Points

Measurement Label

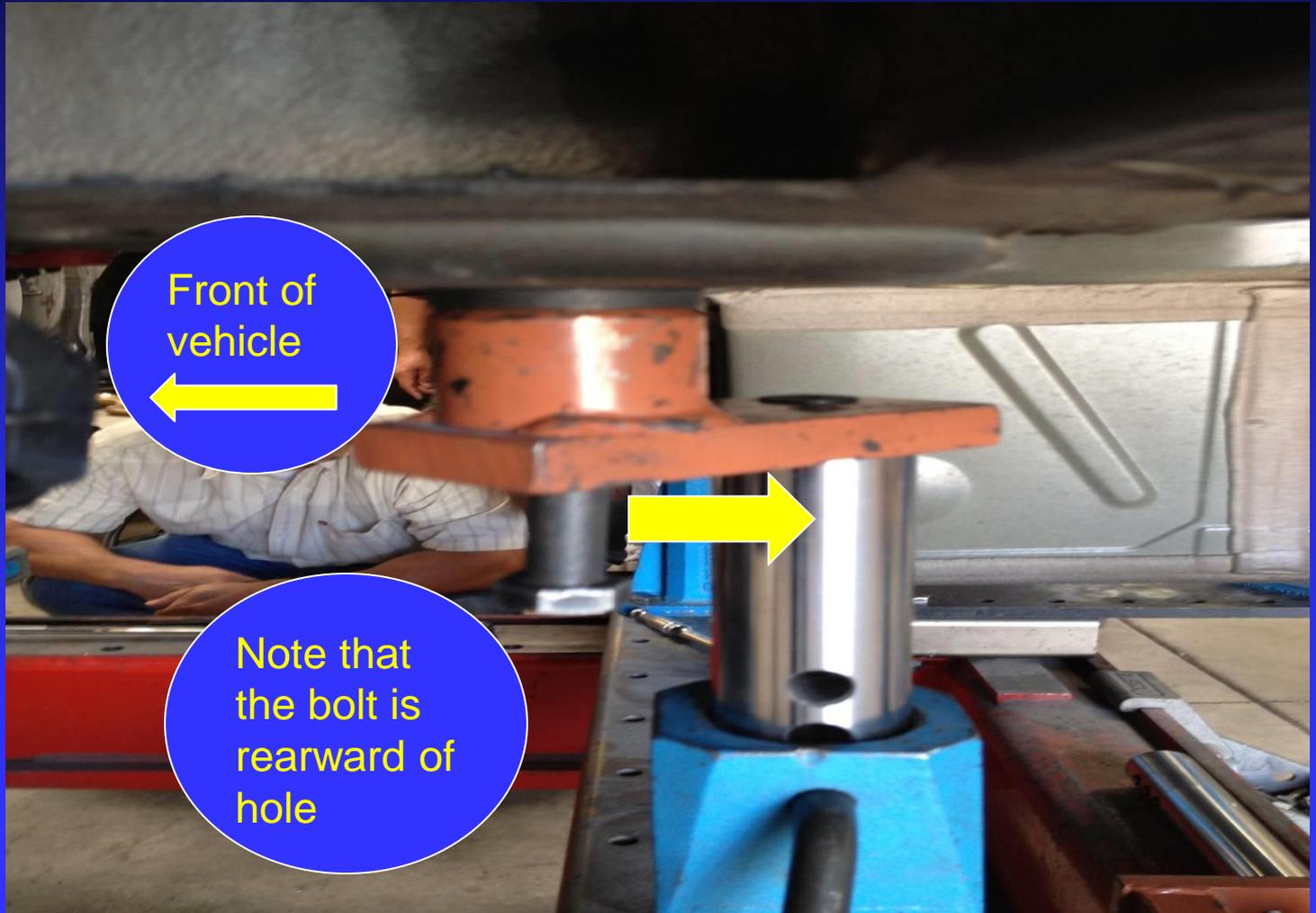
Navigation

Return to Repair Analysis Gallery

1:32 PM 10/14/2012



2011 BMW 7 Series on Celette Bench





A quarter panel replacement at the “C” pillar on BMW’s



Metal Filler

Metal filler is used to fill the seam that was cut during a quarter panel replacement. It is important to follow all the guidelines in "Information on Metal Filler" found in ISTA. There you will find information on storage temperature, shelf life, surface pre-treatment, mixing ratio, application, and hardening time.



NOTE: Curing is temperature sensitive. Follow all the steps to achieve properly cured metal filler.

A second application of Metal Filler is not permitted. (Insufficient adhesion)

EMC Screws

EMC (Electro-Magnetic Compatibility) screws are used to electrically connect the new bonded component to rest of the vehicle. Adhesive acts as an insulator and the rivets don't always supply a good enough electrical connection. The EMC screws are installed after the adhesive has dried. A 4.2mm hole must be drilled. They are self threading, and must be sealed before the application of top coats. The specific amount and location is listed in ISTA repair instructions.





Dealer Communication



February 28, 2012

Read if Red	DEALER PRIN	GENERAL MGR	SALES MGR	CPO MGR	SERVICE MGR	PARTS MGR	WARRANTY MGR	F&I MGR
From: Audi After Sales Mark Allen				Action Required: NO		Deadline: N/A		

Audi Collision Repair Position Statement of Repair: Wheel Repair and Reconditioning

The following is applicable to all Audi models:

To promote and maintain its rigorous standards of quality and safety, Audi provides collision repair centers with critical information pertaining to collision repair and parts replacement on Audi vehicles. Wheel reconditioning is a process by which a collision-damaged wheel surface is repaired to eliminate collision damage. This process may include heating, filling, straightening, welding, removing wheel substance, reshaping, re-plating, or removing wheel substance.

WARNING: Reconditioned wheels will not meet the specifications of genuine Audi wheels and are not an acceptable method of repair on any Audi vehicle. A reconditioned wheel, or any wheel not approved by Audi, may cause unsafe vehicle operation and performance, including loss of control which may result in injury or death of the vehicle occupants or other drivers. Audi approves only wheel repairs which are limited to surface sanding and cosmetic refinishing that removes and replaces only paint coatings. Any wheel near the area of a vehicle sustaining collision damage, should be thoroughly examined to ensure that it is without damage.

of ATTACHMENT(S): 0

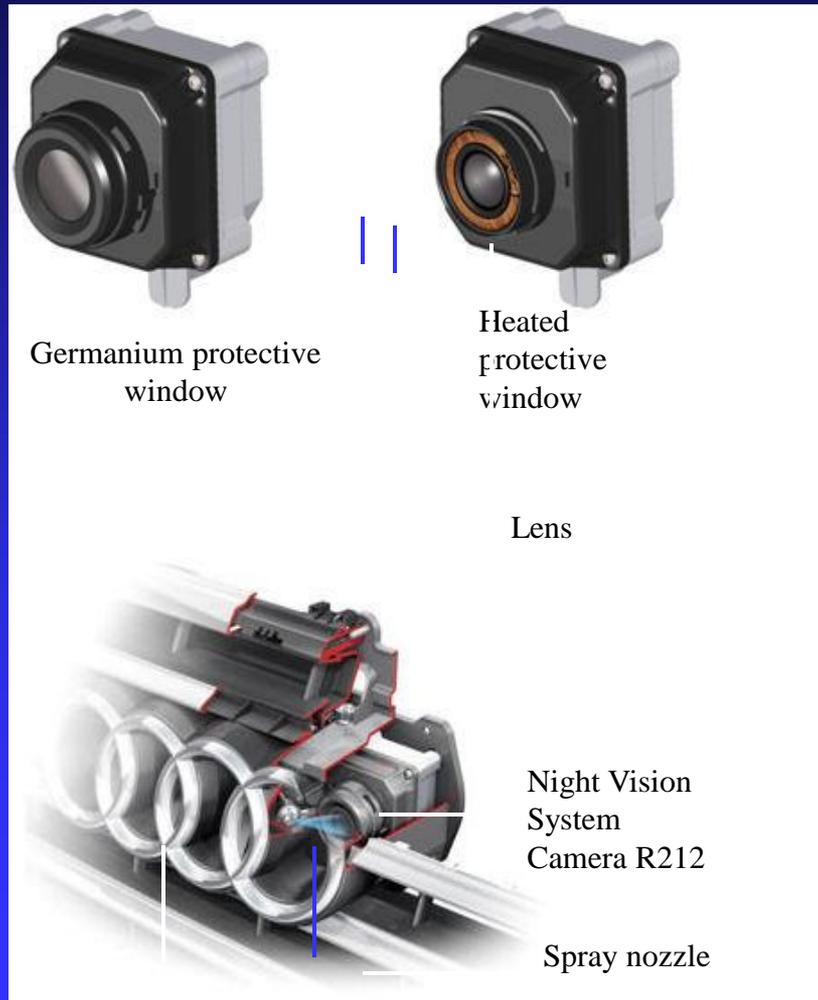
Dealer personnel will receive this material via email by 9:30 a.m. on **Wednesday, February 29th**.



The next incarnation of Ford's F-150 will be as tough as ... aluminum? By 2014 the company will be building most of the body of its signature truck out of that lightweight metal in a bid to boost its fuel economy, in what the [*Wall Street Journal*](#) calls "one of the biggest gambles in its 108-year history." The aluminum body will weigh about 700 pounds less. That alone will improve efficiency, and it could pave the way for smaller, more efficient engines. The move comes amid gradually tightening federal fuel regulations that will ultimately force vehicles to average 54.5 miles per gallon by 2025. The new F-150 will keep Ford in compliance through 2020. But aluminum is expensive, and might turn off some truck purists. "There is going to be a certain percentage of the people that will bitch and complain," one dealer says. "But they will ultimately get that vehicle."

Night Vision Assist

Night Vision System Camera R212



- ▶ Infrared thermal imaging camera.
- ▶ 320 X 240 pixel resolution.
- ▶ 30 frames per second.
- ▶ Stores last calibration results.
- ▶ Germanium protective window.
- ▶ Window heated at temps < 43°F (6°C.)
- ▶ Cleaned by washer jet.
- ▶ Protective window and seal replaceable.

Night Vision Assist

Detection of animals and cyclists



- ▶ Larger animals are identified because of their body heat.
- ▶ Smaller animals are not identified.



- ▶ Cyclists are clearly visible but at times are not fully highlighted.
- ▶ Motorcyclists are not highlighted by system.

Night Vision Assist

Highlighting detected pedestrians

- ▶ Identification done through infrared camera technology.
- ▶ Classification of persons based on a list of categories.
- ▶ Detected persons highlighted by a yellow rectangle with brackets.
- ▶ No classification of persons who are partially concealed.
- ▶ Classification of persons only within a distance of approximately 50 ft to 295 ft (15m to 90m) of camera.



Night Vision Assist

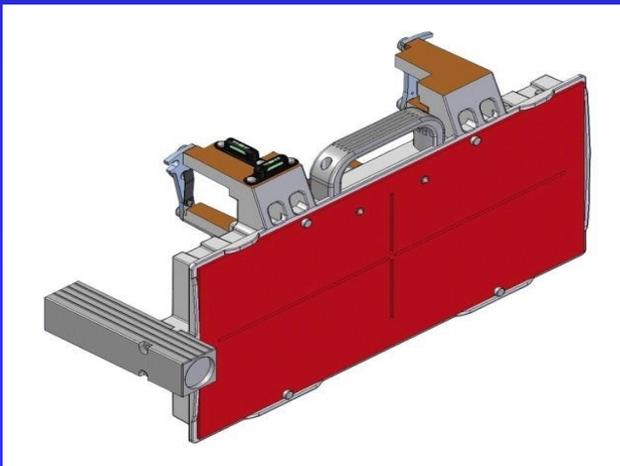
Calibration



VAS 6430

What special tools are needed?

- ▶ VAS Scan Tool.
- ▶ VAS 6141.
- ▶ VAS 6430 or VAS 6430/1.
- ▶ Calibration plate VAS 6430/6.
- ▶ Laser measuring device VAS 6350/3.



VAS 6430/6

When do you re-calibrate system?

- ▶ Replacement of camera.
- ▶ Replacement of camera housing mounting bracket.
- ▶ Replacement/removal of front bumper.
- ▶ DTC: No or incorrect Basic Setting in control module.
- ▶ After vehicle alignment.

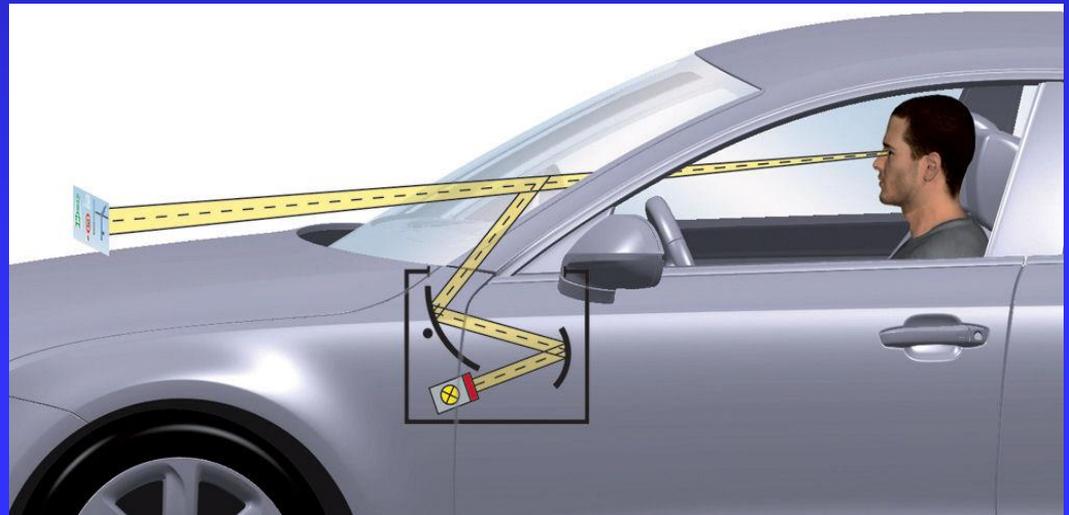
Head-up Display

Position controller for head-up display,
Windshield Projection Head Up Display Button E736

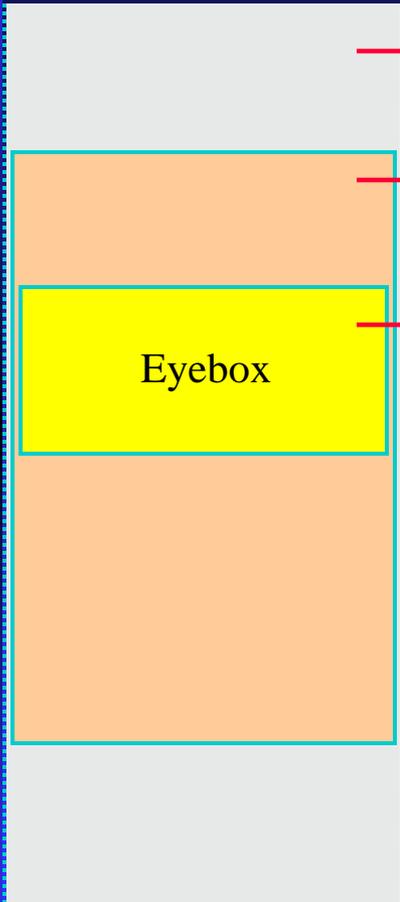


Instrument panel lighting control

Windshield Projection Head Up Display
Control Module J898



Heads-up Customer: accessible vertical calibration



- ▶ The adjustment range of the eyebox can be aligned vertically on the windshield by the customer.
- ▶ Adjustment range of the eyebox determined by the service vertical calibration.
- ▶ Visible area in which the driver sees the head-up display untruncated.

Position controller for head-up display,
Windshield Projection Head Up Display Button E736



Heads-Up: Service calibration with the VAS Scan Tool

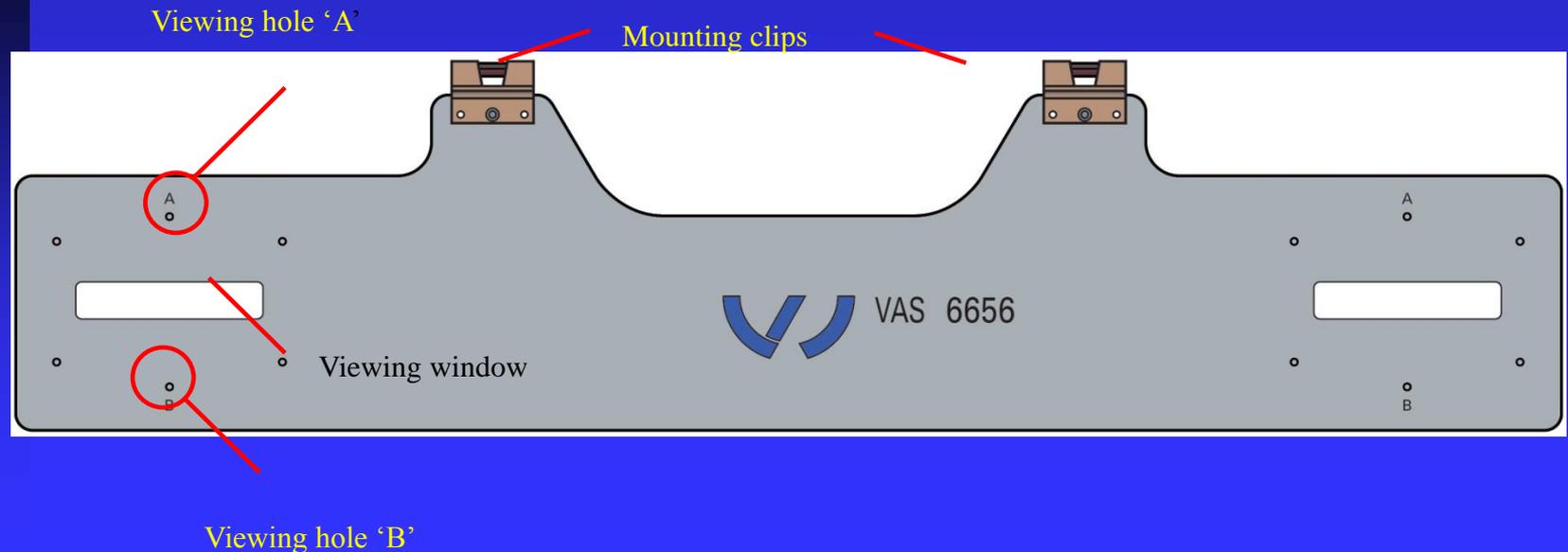


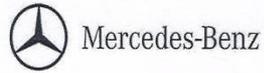
Two-step calibration:

- ▶ Height adjustment.
- ▶ Distortion correction.

What special tools are needed?

- ▶ VAS Scan Tool.
- ▶ VAS 6656.





Mercedes-Benz USA, LLC
A Daimler Company

For safety reasons, the steering gear must be replaced if components of the front axle, steering gear or steering linkage are permanently deformed. A shock transmitted to the steering gear through the front axle or steering linkage may have caused damage not externally visible. A pressure test or crack test required for this is not possible in the workshops; therefore the steering gear is to be replaced in cases of doubt. Should contrary to the opinion of the workshop personnel responsible the steering gear remain in the vehicle, we recommend having the decision of the appraiser or insurance company officer confirmed by his signature.

Should in an exceptional case the condition of a steering gear need to be investigated (e.g. on demand by the insurance company if the steering gear has been mentioned as the cause of the accident), the appraiser or insurance company officer must issue a separate order for this.

3. Accidents with a driver airbag which has been triggered

In the event of accidents with a driver airbag which has been triggered the steering wheel and steering column tube must always be replaced.

Due to the driver airbag being triggered damage can occur to the steering wheel and the steering column tube which is not visible externally. If the damage referred to here is a claim, we recommend notifying the appropriate insurance company or the authorized automotive expert about the necessity of this procedure.

- **Aftermarket Parts, Radiators & Condensers.** – No aftermarket parts of any kind should be used during collision repairs.
- **MKS Wheel Alignments Cost of Caster/Camber Kits and Labor Times.**
-Refer to Startime. Vehicle dependent.
- **Code Clearing After Collision** – All safety system codes must be diagnosed repaired and then cleared. If codes are found during diagnostic tests, printouts should be made and stored in the vehicle file.
- **Distronic Calibration** - Initialization of the DTR control unit (A89n1) is necessary after:

- Replacement of the DTR controller unit (A89)
- Replacement of the steering column tube Module (N80)
- Replacement of the rotational speed Sensor and lateral acceleration (B24/15) (Model 209, 211, 215, 216, 219, 220, 221, 230, 240)
- Replacement of the yaw rate sensor for Lateral and longitudinal acceleration (B24/15) (Model 164, 251)

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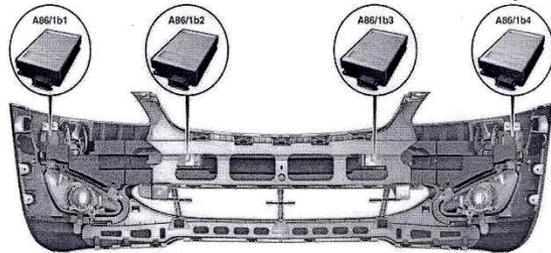
CL S

Painting bumpers with short range radar

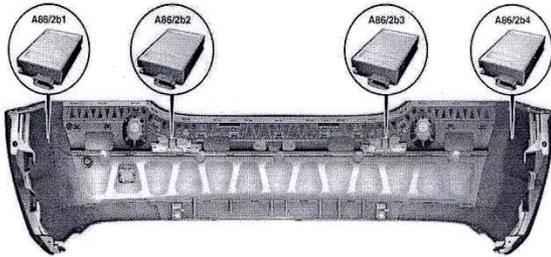
Model 216, 221
with Park Assist
with DISTRONIC Plus

When performing filling and painting work on the bumpers, it is important to make sure that the maximum coat thickness is not exceeded at the short range radar sensors. This can lead to malfunctions as the sensors detect the excessive coat thickness as an obstacle. The limit value for the coat thickness at the sensors is two coats of paint. If the short range radar does not function correctly after painting, either the paint must be removed or the bumper must be replaced.

ONE FACTORY
ONE REFINISH
NO REPAIR
MATERIAL



Location of radar sensors in front bumper, shown on model 221
A86/1b1 Left outer radar sensor
A86/1b2 Left inner radar sensor
A86/1b3 Right inner radar sensor
A86/1b4 Right outer radar sensor



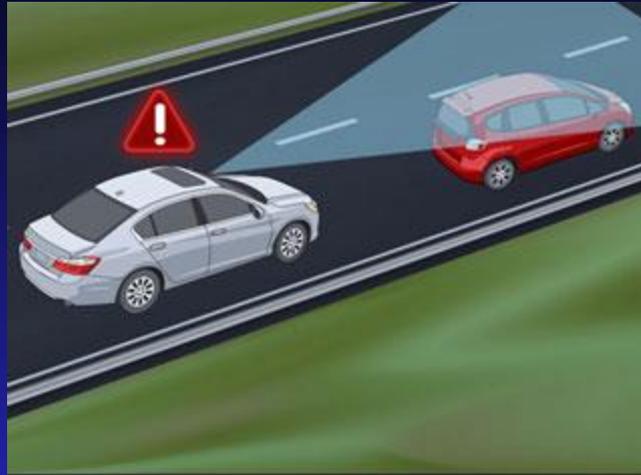
Location of radar sensors in rear bumper, shown on model 221
A86/2b1 Left outer radar sensor
A86/2b2 Left inner radar sensor
A86/2b3 Right inner radar sensor
A86/2b4 Right outer radar sensor



Lane Departure Warning (LDW)

A small camera mounted at the top of the front windshield tracks lane markings on the road, and it can detect when the driver is making an un-indicated lane departure[1]. Visual alerts will light up on the driver's instrument panel and the system also can provide an audible warning.

[1] LDW only alerts drivers when lane drift is detected without a turn signal in use. LDW may not detect all lane markings or lane departures; accuracy will vary based on weather, speed and road condition. System operation affected by extreme interior heat. Driver remains responsible for safely operating vehicle and avoiding collisions



Forward Collision Warning (FCW)

A small camera mounted at the top of the front windshield or, in the case of the Touring model, a radar system mounted in the front grille can detect the presence of vehicles in front of you.

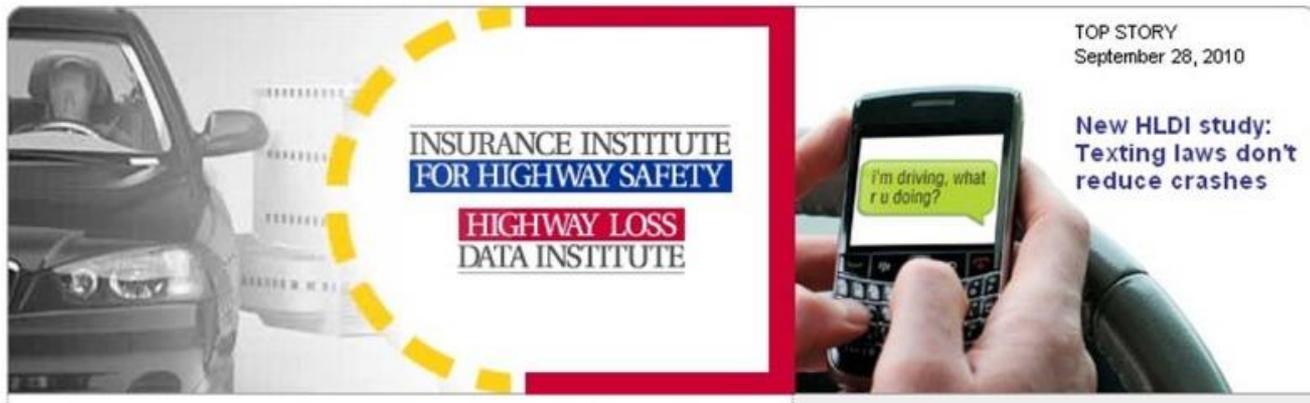
When the FCW system calculates that you are at risk of a collision, it immediately activates visual and/or audible alerts

Guess which car these features
are standard?



2013 Honda Accord

<http://www.iihs.org>



The banner is split into two main sections. On the left, a grayscale image of a car's front end is partially visible. In the center, a white rectangular box with a red border contains the text "INSURANCE INSTITUTE FOR HIGHWAY SAFETY" in blue and "HIGHWAY LOSS DATA INSTITUTE" in red. A yellow dashed circle is positioned behind the text. On the right, a hand is shown holding a black mobile phone, with a green text bubble on the screen that says "i'm driving, what r u doing?".

TOP STORY
September 28, 2010

**New HLDI study:
Texting laws don't
reduce crashes**

Vehicles equipped with electronic stability control (ESC)

About half of the fatal passenger vehicle crashes that occur each year involve a single vehicle. Equipping vehicles with ESC can reduce the risk of involvement in these crashes by more than 50 percent.

The government requires ESC on all passenger vehicles as of the 2012 model year. To find out if an earlier model is equipped with ESC, use the drop-down menus below.

Choose a vehicle:

Consumer note: Electronic stability control is marketed by a variety of brand names — [click here for trade names of this feature](#)

How ESC helps drivers maintain control: [explanation with graphics](#)

ESC research topics page (includes Institute study findings)

Percent ESC availability by vehicle type

		2011	2010	2009	2008	2007	2006	2005	2004	2003	2002	2001	2000	1999	1998	1997	1996	1995
Cars	Standard	90	88	74	65	56	48	37	34	30	28	24	17	8	5	2	1	1
	Optional	5	7	14	18	17	19	18	18	17	16	11	8	8	5	2	2	-
	Not available	5	5	12	17	27	34	45	48	53	56	65	75	84	90	97	97	99
SUVs	Standard	100	100	100	96	88	66	38	23	17	10	9	3	1	-	-	-	-
	Optional	-	-	-	1	2	5	12	18	15	3	2	-	-	-	-	-	-
	Not available	-	-	-	3	11	28	50	58	68	86	89	97	99	100	100	100	100
Pickups	Standard	72	62	38	11	9	1	-	-	-	-	-	-	-	-	-	-	-
	Optional	15	2	19	20	14	16	18	5	2	-	-	-	-	-	-	-	-
	Not available	13	36	43	70	77	83	82	95	98	100	100	100	100	100	100	100	100
All	Standard	92	85	74	63	51	41	29	22	19	16	14	9	4	3	1	1	1
	Optional	4	4	11	13	12	14	16	15	12	9	6	4	4	3	1	1	-
	Not available	4	11	15	24	36	45	55	63	69	75	80	86	91	94	98	98	99

Vehicles equipped with crash avoidance features



Crash avoidance features are rapidly making their way into the vehicle fleet. Six of the most common new technologies are forward collision warning, auto brake, lane departure warning, lane departure prevention, adaptive headlights and blind spot detection.

Use the dropdown menus below to find out which models come with which features.

Select year: Select make:

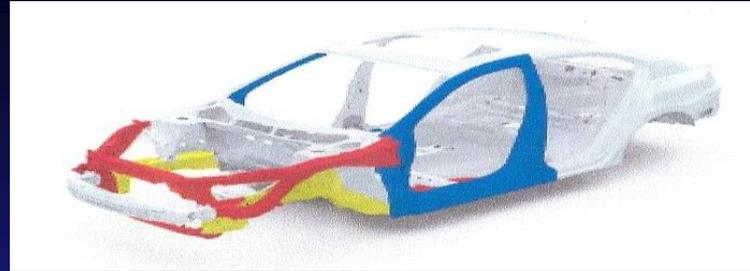
Standard Optional Not available

Model name	Forward collision		Lane departure		Adaptive headlights	Blind spot detection
	Warning	Auto brake	Warning	Prevention		
2012 Toyota Camry 4dr	-	-	-	-	-	-
2012 Toyota Camry hybrid 4dr	-	-	-	-	-	-
2012 Toyota Prius hybrid 4dr	-	-	-	-	-	-
2012 Toyota Prius plug-in hybrid 4dr	-	-	-	-	-	-
2012 Toyota Prius V hybrid station wagon	-	-	-	-	-	-
2012 Toyota Sequoia 4dr	-	-	-	-	-	-
2012 Toyota Sequoia 4dr 4WD	-	-	-	-	-	-
2012 Toyota Sienna	-	-	-	-	-	-
2012 Toyota Sienna 4WD	-	-	-	-	-	-

Additional information:

Q&A with animations showing the technologies in action

More crash avoidance technologies research



The newly redesigned 2013 Accord body uses 55.8-percent high-tensile steel, more than in any previous Accord. And 17.2-percent of the steel is grade 780, 980 and 1,500 MPa, extremely high grades that have never before been used in any Accord, and in fact, very few other cars, according to Jason Bartanen, of I-CAR

"This is one of the first cars to use such high strength steel (1500 MPa) in its body structure," says Bartanen. "Most applications only use it only for bumper beams. But the new Accord uses ultra-high strength steel in its A pillar and B pillar reinforcements as well as its rocker reinforcements. Honda is requiring MIG brazing only in these areas.

While Honda is not the very first to build such a body structure, none of the previous vehicles even come close to the sales volume of the Accord. "The Volvo XC60 is also using similar ultra-high strength steel (1,500 MPa) in the structure," Jason Bartanen, of I-CAR noted.

The Accord has historically sold between 250,000 and 400,000 units a year compared to XC60 sales of approximately 25,000

Ultra High Strength Steel

This information provides repair recommendations and general guidelines for steel classified as Ultra High Strength Steel, also known as UHSS. This type of steel normally has a tensile strength greater than 700 MPa.

This includes the common steel names of:

- Ultra High Strength Steel (UHSS)
- Martensitic Steel (MS)
- Press Hardened Steel (PHS)
- Boron Steel

General Motors recommends the following when repairing or replacing this type of steel during collision repair.

Important::

- Repair of this type of steel is not recommended.
- This type of steel should be replaced only, at factory joints. Sectioning or partial replacement is not recommended.
- The use of heat to repair damage is not recommended for this type of steel.
- Stitch Welding is not recommended for this type of steel.
- This type of steel can not be used as a backing reinforcement or a sleeve for a sectioning joint.

Recommended Repairs:

- Squeeze Resistance Spot Welding can be used to replace factory spot welds, where applicable.
- MIG plug welding can be used to replace factory spot welds.
- MIG Brazing can be used to replace factory spot welds.